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ABSTRACT

This monograph contains the conference proceedings of the 1996 conference of the Society for the Advancement of Gifted Education (SAGE). The major focus of the conference was to explore "state-of-the-art" knowledge regarding social-emotional development, thinking skills, philosophy, First Nations education, creativity, counselling techniques, charter schools, instructional resources, and gender issues as they relate to the unique needs of gifted and talented individuals. This document presents summaries of selected conference sessions. The seven presentations are: (1) "The Concept of Giftedness in the Context of First Nations Culture and Philosophy" (John W. Friesen), which discusses giftedness in the Canadian Native cultural context; (2) "Artifact Box Session" (Joanne Lozynsky), a description of a biannual interschool project in which students collect and exchange artifacts representative of their locale; (3) "GTEC [Gifted and Talented Education Council] Resources (Chris Meaden and Terry Oseling), which describes the "Dimensions of Learning" framework for designing and assessing integrated lessons; (4) "The Emotional Drama of Giftedness: Self-Concept, Perfectionism, and Sensitivity" (Sal Mendaglio and Michael C. Pyryt); (5) "Fun in Sciencing" (Micheline Rivard), which provides a collection of science activities for the junior high level; (6) "You Are What You Ask--The Power of Teaching Students' Questioning Skills for Enabling Thinking" (Bernard Schwartz and Garnet Miller); and (7) "Intuition and Giftedness" (Carolyn Yewchuk), a discussion of the mechanisms of intuition and suggestions for fostering it. (DB)

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ED 408 744

"Faces of Excellence"

CONFERENCE PROCEEDINGS

7th Annual SAGE Conference
September 27-28
1996
The University of Calgary
Calgary, Alberta

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Society for the Advancement of Gifted Education

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FACES OF EXCELLENCE
1996

CONFERENCE PROCEEDINGS

7th Annual SAGE Conference
The Society for the Advancement of Gifted Education

Conference Proceedings produced by
The Society for the Advancement of Gifted Education
c/o Centre for Gifted Education
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FACES OF EXCELLENCE

7th Annual SAGE Conference

The Society for the Advancement of Gifted Education (SAGE) is an umbrella organization consisting of the primary stakeholders in gifted education in Alberta: the Centre for Gifted Education (CGE) at The University of Calgary, the Gifted and Talented Education Council (GTEC) of the Alberta Teachers' Association, the Alberta Associations for Bright Children (AABC), and Alberta Education.

The 7th Annual SAGE Conference with a theme of *Faces of Excellence* was held at The University of Calgary on September 27-28, 1996.

The major focus of the Conference was to explore "state-of-the-art" knowledge regarding social-emotional development, thinking skills, philosophy, First Nations education, creativity, counselling techniques, charter schools, instructional resources, and gender issues as they relate to the unique needs of gifted and talented individuals. Once again, this year's conference sponsored a Youth Strand component which provided instructional activities for students ages 8-12.

We are pleased to provide this document, which represents summaries of selected conference sessions. For those participating in the 7th Annual SAGE Conference, we hope these Proceedings capture the spirit of the conference. It should be noted that Drs. Linda Silverman and Joseph Hester's presentations appear in the Fall 1996 AGATE (Journal of the Gifted and Talented Educational Council of the Alberta Teachers' Association).

We are grateful to The University of Calgary Special Projects Fund for providing funding for Dr. Silverman's travel and accommodations. We hope you find these Proceedings informative.

Michael C. Pyryt
Jacquie Langer
Conference Co-Directors

CONFERENCE PROCEEDINGS
1995
7th Annual SAGE Conference
'Faces of Excellence'

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The Concept of Giftedness in the Context of First Nations Culture and Philosophy

John W. Friesen
The University of Calgary

The session will comprise two major parts:

FIRST PART

This session will begin with an elaboration of a series of concepts unique to First Nations culture and philosophy to set the context for a discussion of giftedness in an Aboriginal setting. Concepts to be examined include: (i) Belief in connectedness; (ii) Respect for, obeisance to the universe; (iii) Being, not doing; (iv) Extended family obligations; (v) Complexities of sharing/taking--"giving back"; (vi) Community versus individuality; and, (vii) Governance via consensus.

SECOND PART

The balance of the session will deal with the components of giftedness in the Native context. Information presented was gained from an examination of relevant literature and a survey of a selected group of Blackfoot (Siksika) university students. Particularly useful journals include the *Journal of American Indian Education* and the *Canadian Journal of Native Education.*

(i) Definitions of giftedness

Definitions of giftedness in a First Nations context are quite different from those usually utilized by psychologists and educators. For example:

> Giftedness in the Blackfoot culture is usually when a child has some special qualities about himself or herself. If the child is kind and friendly, and has compassion and respect for everybody, especially the elders. This person is usually considered a gifted child. If the child learns early in life to seek advice from the leaders and thinks twice before they do anything they might regret. Usually such a child has wisdom. The elders usually consider this to be a gifted child especially if they speak the Blackfoot language (Blackfoot Interviewee).

> First, it is important to maintain, and in many instances, retrieve Tribal ways of thinking about the underlying mystical assumptions about human beings' relation to nature. The connectedness to the land and animals that Indians have always stressed, would not only ensure the survival of the planet if universally accepted, it would also offer a foundation for sanity which people on the whole have lost....Secondly, gifted and talented Indian students should be encouraged to balance their individuation with family and tribal participation (Robbins, 1991, 22-23)

(ii) Traits of giftedness

The tell-tale signs of giftedness in a Native context are markedly different from those "normally" associated with that characteristic. In a Native context a gifted child may indeed manifest the following traits:

The child may:

(a) be humble (not boastful or assertive about one's accomplishments;
(b) Reveal better aural/oral memory than visual memory;
(c) not be competitive with peers for leadership roles;
(e) need more concrete situations in which to learn than other students;
(f) use traditional ways of dealing with personal issues (e.g., sing, using a medicine man or other methods unconventional by white middle-class; or,
(g) prefer that family and religious or spiritual activities take precedence over school functions, etc. (Hartley, 1991, 57-58).

Native educators emphasize a knowledge of Indian heritage, culture and language as important components in the repertoire of a gifted individual.

Fundamental values, cognitive and social developmental experiences, and other aspects of Keresan Pueblo culture create cultural notions of giftedness notably different from the mainstream notions of giftedness. This difference between Keresan Pueblo and mainstream notions of giftedness is a reflection of the values and goals of the respective societies and contributes to the underrepresentation of Native Pueblo learners in New Mexico's gifted programs. (Romero, 1994, 36)

A gifted child in Blackfoot culture should be able to speak the Blackfoot language well, understand the values, customs, beliefs, and traditions of the culture. The child must participate in Native religion and the duties that come with it. The child must be tolerant and acknowledge wisdom (Blackfoot interviewee).

A gifted child in Blackfoot culture is one who is rich in his or her culture and language. The characteristics of giftedness are respect, honour, love, and knowledge of tradition and language. A teacher should look for traits of cultural knowledge, Native awareness, kindness to one another and respect for all individuals (Blackfoot Interviewee).

(iii) Identifying giftedness

The strong preference in First Nations communities to stress community instead of individualism makes it a very complex matter to decipher the exact role that the "gifted" individual plays in the community.

Being gifted or talented means, to me, to be just normal. Everyone has a special gift or talent, even if it is not visible. Everyone can contribute in some way to make this a better world (Charles Ulrey, Ottawa Indian, age 16, 1991, 25).

All "gifts" or advanced skills possessed by Indian children as something of worth go unrecognized in the American school system. ...Tribal people noted as shamans, holy men, or medicine people, are the only persons actually defined or perceived as gifted by Tribal people. Tribal people create norms of behaviour within Tribal society that allow for such gifts to be exercised and recognized, but with certain restraints. The gifted people understand their responsibilities for the abilities given them by the Creator. Thus, the person is humble and not termed "gifted" or "special" in mainstream gifted and talented programs (Christensen, 1991, 11).

A Zia Pueblo woman was identified by her peers as being talented or "traditionally gifted" would reflect four domains:

(i) she possesses cultural knowledge of food preparation including song and prayer (knowledge-ingenuity domain);
(ii) she is articulate and fluent in her Native language (linguistic domain);
(iii) she has mastered *piki* bread-making, and is a noted seamstress (creativity-psychomotor domain); and,
(iv) she freely gives of her time, knowledge, effort and energy as exemplified by her consistent participation in various tribal activities or functions, her sharing of knowledge, (sharing) her talents to others (affective-heart domain) and teaching (Romero, 1994, 43).

(iv) The Function of giftedness

In the Native context, giftedness, like all other behaviours has an obligatory side. For example:

To American Indians and Alaska Natives, all gifts and talents are not theirs by earned right. *They are distributed by the Creator with care instructions from the Master of life, and should be practiced properly within the Circle and for purposes of enhancing the life experiences of unborn generations....* [Italics mine] During the years of required education, the gifts and talents given to Indians people, must be nurtured and not destroyed. Because of cultural differences which are not understood, an unkind classroom environment often develops and contributes to the high percentage of dropout and "push-out" Indian students beginning as early as the fourth grade (Christensen, 1991, 13).

From the earliest memory of tribal people, mostly related in our stories of creation to stories of how things came to be, there have been gifted people and talented people among us. They were not designated as such by our people, but they were accorded exalted status by virtue of what they could do as peacemakers, religious persons, warriors, orators, planners, logicians, healers, singers, dancers, and artisans to name a few....They were taught in an environment in which they learned by example, learned at their own pace, learned by discovery, and learned fro grandparents and uncles or aunts with whom they shared a symbiotic relationship. The knowledge of skills passed on from one to another in a nonthreatening and open environment until the teacher/mentor passed on, and the "student" became the mentor/teacher to another generation (Tonemah, 1991, 3).

Unless cultural definitions for concepts such as giftedness are taken into account, educators run the risk of miseducating children for environments in which they will eventually function as adults.

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Artifact Box Session

Joanne Lozynsky
Calgary Catholic Board of Education

1. INTRO
- Ed Plus teacher, presentlv St. Michael School (246 1551)
- program description
- based in Connecticut
- 10 + years, thousands of exchanges
- mostly US , some Canada and overseas
- any grade level
- from one student> small group > whole class .
- often used as a small group project for enrichment programs

2. OVERVIEW
- biannual (runs twice a year)
- students collect, tag, and reference a set of artifacts that are representative of their locale
- checklist of 24 locally available objects eg. picture of local landmark, sample of food product grown or produced, weather reports
- also suggestions for references to use to identify region
- package & mail to mystery location (known only to teacher)

3. OBJECTIVES (some possibilities...)

Students will
- use critical and creative thinking skills
- compare their culture with a distant one
- be motivated to use advanced references
- gain knowledge of content and processes used by geographers, archaeologists, anthropologists
- locate and interview human resources
- appreciate the need to plan and organize work

And many other possible extension activities...

4. TIMELINES

Fall	Spring
- start right away	- start after Christmas
- register by Sept 30	- register by Jan 30
- work on box Sept Oct Nov	- work on box Jan,Feb,Mar
- mail box by Nov 30	- mail box by Mar 25
- allow 2- 3 weeks	- allow 2- 3 weeks
- solve box during Jan	- solve box in April,May
- return box by Jan 29	- return box by May 10

Suggestion - allow 6 to 8 weeks (1 1/2 to 2 hours per week)

5. COST First time: Teacher Guide $15.00 **NOTE!! US DOLLARS
Exchange Fee $30.00

Each time after: Exchange fee only $30.00

6. HOW TO Register - Allow 2 - 3 weeks response

Preteaching - getting Ready (p 12,13)

Readiness - suggestions (p 15, 16)

Simulation - from guide (p 19 to 29)

Guidelines - from Guide (p 35, 36)

Prepare Artifacts and box - THIS IS THE FUN PART ! ! ! ! ! !
(use task cards, prepare clue cards)

Prepare to mail box - Group EASY, MEDIUM, DIFFICULT
Forms - list of artifacts, answers to clues, blank evaluation form

Find out who your partner is - phone. e-mail, fax FUN PART ! !

Mail Box; Wait for Partner's Box to arrive

Receive Partner's Box - A REALLY FUN PART ! ! ! !
keep 2 - 3 weeks; SOLVE; evaluate using form(s)

Return Box in Mail; get yours back; read evaluations

Register again ! for next exchange (may use same box for a new exchange)

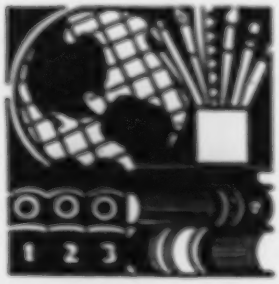
7. SAMPLE ARTIFACTS
- MANY other ideas not represented here: poetry, Computer disc, what makes our community special etc.

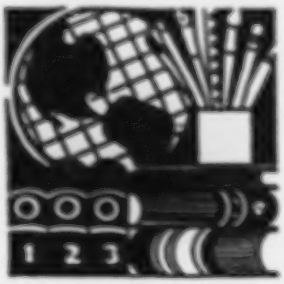
The Artifact Box Exchange Network

Scott E. Johnson, Co-Director

Brian D. Reid, Co-Director

Heather Holmberg, Originator



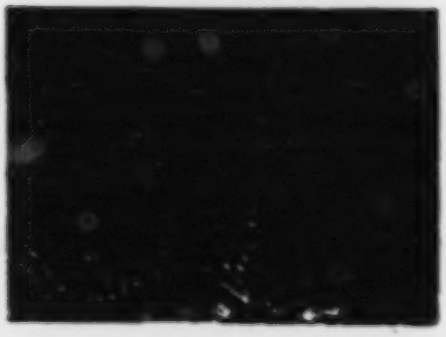


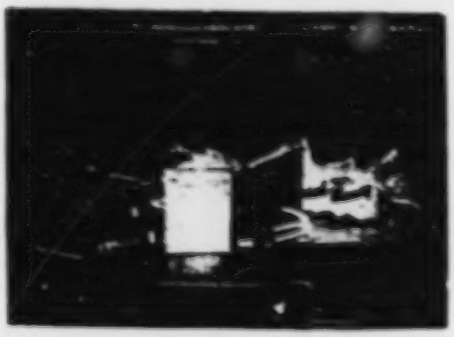
WHAT IS THE ARTIFACT BOX EXCHANGE NETWORK?

The Artifact Box Exchange Network is a biannual, interschool project that involves students in the development of advanced research, reference, and reasoning skills through the use of a hands-on simulation activity. Borrowing content from the disciplines of archaeology, geography, and science, the network serves as a vehicle that allows students to collect, tag, reference and exchange a set of artifacts, or "clues", that are representative of their locale.

Using a checklist of twenty-five locally available objects, each participating class is responsible for conducting an academic scavenger hunt to locate such items as a picture of a local landmark, a sample of a food product that is grown in their region, a set of seasonal weather reports from the town newspaper, or a two-inch portion of an area roadmap.

This collection of artifacts, complete with attached suggestions for finding appropriate references that might be used to identify their region, state, or city, is then assembled and packaged as an "Artifact Box". The box is exchanged directly with a "mystery" partner classroom in a distant locale, the identity of which is known only to each classroom's teachers. Without revealing the location from which these artifacts were collected, the receiving teacher displays the box's contents to student researchers in the partner school. These students are then assigned the task of using available reference books and non-print resources to identify the country, state or province, and town from which these artifacts were gathered. It has proven to be a unique and motivating activity that affords students a first-hand experience with basic geography and science concepts.





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WHO CAN PARTICIPATE?

Participation is open to classes or groups of students in grades one through twelve. A participating teacher may register for either one or two exchanges per year. It is requested that a school involve no more than four groups in any given exchange. Exchanges are made between classes of equal or near equal grade levels.

WHAT IS INVOLVED IN CONSTRUCTING AN ARTIFACT BOX?

Teachers are provided with a list of artifacts that their students must collect for inclusion in their box, a set of forms used to organize and manage the collection of clues, and guidelines relating to the construction of the box and participation in the exchange network. Students are asked to find objects suitable for mailing that correspond to each of the clue descriptions, locate a specific reference or resource which can be used to determine the object's place of origin, complete a clue card listing pertinent information needed to solve the clue, and then package their clues into plastic bags. Most teachers report that it takes between six and ten hours of class time to develop a box and prepare it for mailing.

WHAT ARE THE RESPONSIBILITIES OF THE PROGRAM DIRECTORS?

The Program Directors will provide coordination efforts for the Artifact Box Exchange Network. Teachers' names, school locations, grade levels, and scheduled participation sessions are collected and confirmed throughout the year. Packets are sent to registered teachers, and they are assigned and notified of their partner schools prior to the scheduled Artifact Box Exchange mailing deadline.

WHAT ARE THE OVERALL GOALS?

Participating teachers have noted numerous benefits for students who participate in The Artifact Box Exchange Network. The overall goals of the Exchange Network are:

- To develop creative and critical thinking skills.
- To help students compare their culture with communities in distant locations.
- To motivate students to skillfully apply advanced reference and non-print resources.
- To acquaint students with the content and processes used by geographers, archaeologists, scientists and anthropologists.
- To improve students' attitudes toward social studies, research skills, and science instruction.

WHAT IS THE COST OF INVOLVEMENT?

The Artifact Box Exchange Network is a relatively inexpensive way for teachers to involve students in a thinking and research skills program that integrates science and geography content. The initial cost of the teacher's guide and first exchange is $45.00 while the same teacher may register future classes for $30.00 per exchange. Participating schools are also responsible for the cost of mailing their boxes and returning their partners' boxes. Additional expenditures of no more than $10 are required to locally purchase the raw materials necessary to construct a box. A class' box may be used for more than one exchange.

HOW CAN MY CLASS JOIN?

Teachers interested in becoming a member of the "international" Artifact Box Exchange Network may copy the form that accompanies this flyer. To obtain additional registration forms please contact:

The Artifact Box Exchange Network
P.O. Box 9402
Bolton, CT 06043

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THE ARTIFACT BOX EXCHANGE NETWORK
FALL (SPRING*) SEMESTER DEADLINES

Please read carefully and keep for future reference

SEPTEMBER 30 (JANUARY 30)* — **This is the last day that our office will accept a registration form from a teacher who wants to participate in the exchange. All registration forms must be accompanied by a check or purchase order and received by mail; sorry, no telephone registrations can be accepted. You will be mailed your teaching materials approximately two weeks after we have received your registration and payment or purchase order. If you do not receive the materials within three weeks, please call. You may begin your box as soon as you receive the materials. Please allow 6-8 weeks to prepare your box. You may register for a future exchange at any time. Please do not complete a form for a teacher other than yourself.**

OCTOBER 1 (FEBRUARY 1)* — Confirmations will be mailed to participants with postcard contracts verifying registration information. These contracts must be returned before you can be matched with a partner.

OCTOBER 22 (FEBRUARY 22)* — Deadline for the return of signed contracts. **We must have a signed contract for each participating teacher or that teacher will not be matched.** No one can confirm registration for a teacher other than that teacher. Participants wishing to drop out of the exchange must notify the project directors by this date. Registrations may be transferred to another semester or refunds given (minus $5.00 for postage and handling) only if notification is made before this date.

NOVEMBER 15 (MARCH 15)* — On this day each confirmed participant will be mailed the name and address of their partner's classroom. Please allow one week for this mail to reach you. If you do not receive this information by the 10th, please call our office. Teachers must contact their partner by mail or telephone to verify their participation as soon as possible.

NOVEMBER 30 (MARCH 25)* — On this date all classrooms should mail their completed Artifact Box to their partner classroom. **Do not mail your box until you have contacted your partner.** Do not change this date unless you have made explicit arrangements with your partner.

DECEMBER 5 (MARCH 30)* — Students receive their mystery Artifact Box and are asked to use research and reference skills to uncover the location. If the box has not been received promptly, call your exchange partner.

JANUARY 29 (MAY 10)* — This is the last day for teachers to return their Artifact Box and evaluation cards to their partner teacher. Please box and handle with care. The box is only borrowed from your partner and must be returned in a timely manner. Many teachers reuse their box for a future exchange.

THE ARTIFACT BOX EXCHANGE NETWORK: P.O. Box 9402, Bolton, CT 06043
For registration, partner information, billing & technical assistance, call (203)643-1514

REGISTRATION FORM

THE ARTIFACT BOX EXCHANGE NETWORK

P.O. Box 9402
Bolton, CT 06043
For Registration, Partner Information,
Billing & Technical Assistance (203)643-1514

Registration Guidelines:

1. Only one (1) registration per form.
2. Only the teacher involved should complete this form.
3. Payment or purchase order must accompany this form.
4. Please make checks payable to "Artifact Box". Submit U.S. funds only.
5. Sorry, no telephone registrations accepted.
6. Orders must be received by the semester deadlines.
7. All information must be completed

Registration Deadlines: Fall - September 30 / Spring - January 30

Please type or print all information neatly.

I WISH TO RECEIVE: _____ONE COPY OF THE TEACHER'S GUIDE ($15.00)
_____ONE CLASSROOM EXCHANGE ($30.00)

I WISH TO PARTICIPATE IN THE: (Check one & indicate year)

___ FALL SEMESTER, 19___ *OR* ___SPRING SEMESTER, 19___

METHOD OF PAYMENT: _____ CHECK (# _____)

_____ PURCHASE ORDER (# _____)

Teacher's Name _____

School Name _____

Street Address _____

City _____ **State/Province** _____

Zip Code / Postal Code _____

School Telephone ( ) _____

Home Telephone ( ) _____

(Your home number will not be distributed. You will be called at home only if a problem arises.)

Grade Level(s) of the class preparing box _____

Number of past participations by this teacher_____

Previous Exchange States (if any) Assigned to this Class _____

6/95

GTEC Resources (Gifted and Talented Education Council)

Chris Meaden/ Terry Gerling
GTEC of the Alberta Teachers' Association

The GTEC mandate is to facilitate the professional development of teachers from ECS to grade 12 and to improve the quality of educational practices for gifted and talented students in Alberta. Look for these resources:

1. The *AGATE Journal* is a collection of theoretical, descriptive and research articles on all aspects of the education of gifted and talented children.

2. The A.S.C.D. (Association for Supervision and Curriculum Development) *videos* contain information about current research in education as well as practical strategies for putting research into practice. We would like to highlight out newest video called *Dimensions of Learning*. This series will help you understand the model, help you design integrated lessons and help you assess each dimension.

Dimensions of Learning is an instructional framework based on the best of what researchers and theorists know about learning. Its premise is that five types of thinking, or *Dimensions of Learning*, are essential to successful learning. The *Dimensions of Learning* framework will help you plan instruction that takes into account all five of these critical aspects of learning.

a. Positive Attitudes and Perceptions About Learning
There are a number of ways that teachers can help students feel accepted and comfortable: establish relationships with each student, monitor their own attitudes, engage in equal and positive classroom behaviors, respond positively to students' incorrect responses or lack of response, provide students with opportunities for cooperative learning, help students develop strategies for gaining acceptance from peers, use activities that involve physical movement, have students identify their own standards for comfort and order, establish and communicate classroom rules and procedures, establish clear policies about the physical safety of students, be aware of teasing or threats.

b. Thinking Involved in Acquiring and Integrating Knowledge
There are many techniques and strategies teachers can use to help students construct meaning: use the three-minute pause, help students experience content using a variety of senses, present students with the K-W-L strategy, use the concept attainment process, use reciprocal teaching techniques, present students with the *before, during, after* strategy.

c. Thinking Involved In Extending and Refining Knowledge
In the dimensions of learning model, eight mental activities stimulate the type of thinking involved in extending and refining knowledge: comparing, classifying, induction, deduction, error analysis, constructing support, abstracting, analyzing perspectives. A teacher can prompt students to use the eight extending and refining activities by asking questions that guide students into and through the activities. A teacher might provide students with ways of graphically representing the comparison/classification/induction process. A teacher might also present students with common types of informal fallacies as well as different ways of developing an argument or analyzing perspectives.

d. Thinking Involved in Using Knowledge Meaningfully
There are five types of knowledge that encourage students to use knowledge meaningfully: decision making, investigation, experimental inquiry, problem solving, invention. Teachers introduce each skill and provide students with the steps involved in the process. Once the students understand the process (e.g., decision making), the teacher gives them structured tasks that will let them practice the process. Ultimately students should come up with their own tasks.

e. Productive Habits of the Mind
Effective learners develop powerful habits of mind that enable them to regulate their behavior, think critically, and creatively. Teachers can reinforce the habits of critical/creative thinking: introduce each of the habits of critical/creative thinking, have students identify situations in which each of the habits of critical/creative thinking would be useful, have students develop strategies or techniques to help them use the habits of critical/creative thinking, have students engage in problem solving or debate.

GTEC also has a number of other video resources that are available for loan. These include a series on multiple intelligences as well as a series on challenging the gifted and on integrating the curriculum.

3. *"Challenging Learners"* is a collection of successful teaching units developed and implemented by teachers of gifted students.

4. *"The Paper"*, a joint publication with the Centre for Gifted Education and Alberta Association for Bright Children, contains information on current resources and recent theory and practice in the field of gifted education as well as details about GTEC events.

*** For more information on these resources, contact your GTEC regional president.

The Emotional Drama of Giftedness: Self Concept, Perfectionism, and Sensitivity

Sal Mendaglio / Michael C. Pyryt
The University of Calgary

Purpose

The purpose of this *Proceedings* paper is to address three complex issues that confront gifted individuals and those who interact with them: developing healthy self-concepts, transforming perfectionistic tendencies into productivity, and effectively coping with emotional sensitivity. The "lived experience" of these issues in daily life provide both frustrations and joys. This dynamic tension makes life richer but more problematic. Following our outline of our presentation at the SAGE conference, this paper will discuss self-concept, perfectionism, and emotional sensitivity respectively.

Self-Concept

Teachers of gifted students, as teachers of any other students, are perennially concerned with self-concept of students. Over the past five years, we have developed an approach to self-concept enhancement which is assessment-based, using an instrument we developed called the Pyryt Mendaglio Self-Perception Survey (PMSPS) (Mendaglio & Pyryt, 1995; Pyryt & Mendaglio, 1994). The PMSPS is a comprehensive assessment measure which provides specific information for intervention. In an effort to address the complexity of self-concept, we have taken a multidimensional, multi-theoretical approach that incorporates established theoretical perspectives, current empirical findings, and a novel feature called valence. The Scale is termed multidimensional since its construction reflects a multi-factor approach. The PMSPS operationally defines self-concept in terms of several factors (academic, social, athletic, physical appearance, and trustworthiness). The scale is also described as multi-theoretical since it was constructed to reflect three major theoretical perspectives to self-concept (reflected appraisal, social comparison, and attribution). The reflected appraisals approach (Cooley, 1902; Mead, 1934; Sullivan, 1953) emphasizes the contribution of feedback from significant others in the development of self-concept. In social comparison (Festinger, 1954), individuals contrast the perception of their ability, behaviour, and accomplishments to those of others. In attribution (Kelley, 1967), individuals infer their own traits based on self-observations similar to their inferring the dispositions of others based on their observations of the behavior of others. To further address the conceptualization of self-concept, we have included a "valence" component to the PMSPS so that the Scale adheres to our conceptualization of self-concept. The student is asked to rate the importance of each facet and significant other.

The content of the PMSPS operationalizes the multi-theoretical perspectives noted above. For the reflected appraisals portion the students are asked to rate themselves as they perceive each of the four significant others perceive them (e.g., "I perceive that my best friend thinks I'm smart"). This is done for each of the five facets (academic, social, athletic, social, and trustworthiness). For the social comparison portions they are asked to rate how they perceive themselves compared to age peers for each of the four factors (e.g., "I do better at sports than other children my age"). For the attribution portion, they are asked to explain domain competence in terms of an aptitude or trait (e.g., "When

I do the right thing, it is because I am trustworthy"). For each of the 30 self-concept items, the student is asked to rate oneself on a four-point scale ranging from Strongly Agree to Strongly Disagree. The valence items are rated on a three-point scale, with 1, 2, 3 indicating Not Important, Important, and Very Important, respectively.

Once the PMSPS is administered and scored, we propose that the teacher or counsellor interview the student with a threefold purpose: to discuss the results with the student, to confirm specific deficit areas that were identified by the Scale, and to plan a course of intervention. General discussion of the results with the student would include elaboration of some of the ratings. For example, low self-perception in certain areas should be explored, identification of reference group used in the social comparison items should be sought. The valence scores should be pursued. In short, the teacher is directed to use the self-ratings as a guide to structure the interview. The confirmation and elaboration of any low ratings are important components of the interview. In all of this discussion, the teacher should be interested in the adolescent's perspective. It is important to remember that when working with gifted adolescents that they are particularly sensitive to discrepancies that we adults present. When we ask students what they think of themselves, we must be prepared to accept their response. Should we convey, either verbally or nonverbally, that they should be different this would preclude our obtaining the validation of the information that the Scale has given us. The discussion with the student needs to bear in mind that the Scale, like other self-report instruments, can be manipulated by the student. An important underlying purpose of the interview is to gauge whether the ratings that were done match the manner in which the adolescent talks about self. Further, the results of the Scale should be contrasted with the teacher's own knowledge of the gifted adolescent gleaned from observation.

The last purpose of the interview is to assist the teacher in planning an approach to intervention. With a confirmation of the self-perception ratings, the teacher can now use the multi-faceted, multi-theoretical basis of the Scale to advantage. We believe that certain guidelines for intervention emerge from the three models (reflected appraisals, social comparison, and attribution).

Perfectionism

One of the difficulties in describing the construct of perfectionism is recognizing the multiple uses that occur in the literature. There is a fine line between striving to reach high standards of excellence and feeling self-defeated through the inability to reach unreasonable expectations. Some writers, deal with this dichotomy by contrasting two types of perfectionism. Bransky, Jenkins-Friedman, and Murphy (1987) distinguish between enabling perfectionism that empowers individuals and disabling perfectionism that cripples individuals. Hamachek (1978) distinguishes between normal and neurotic perfectionism. Other writers (Barrow & More, 1983; Burns, 1980; Pacht, 1984) use perfectionism to refer to the negative aspects of the syndrome.

Barrow and Moore (1983) prefer the term perfectionistic thinking to perfectionism. Perfectionistic thinking is viewed as a cognitive pattern that many people use at various times to varying degrees, whereas *perfectionism* implies a trait that an individual either has or doesn't have.

Barrow and Moore (1983) have identified common elements of perfectionistic thinking. Frequently, dichotomous (all-or-none) thinking is present. Another element of perfectionistic thinking is viewing goals as necessities rather outcomes worth striving for. Perfectionistic thinking often leads to focusing on unmet goals and challenges rather than savouring successes. There are currently two instruments, both called the *Multidimensional Perfectionism Scale*, that assess the multidimensional aspects of perfectionism. Frost, Marten, Lahart, and Rosenblate (1990) developed a 35-item instrument that assesses six dimensions of perfectionism (concern over mistakes, personal standards, parental expectations, parental criticism, doubts about action, and organization. Hewitt and Flett (1991) developed a 45-item instrument that assesses three dimensions related to perfectionism (Self-Oriented Perfectionism that focuses on excessively high self standards; Socially-Prescribed Perfectionism that addresses perceptions of standards and expectations set by others; and Other-Oriented Perfectionism that examines an individual's expectations for others). Both instruments have been found to demonstrate adequate psychometric properties.

Among educators of the gifted the link between giftedness and perfectionism is clearly established. The tendency toward perfectionism is an item on the most widely-used teacher rating scale for the identification of superior students (Renzulli, Smith, White, Callahan, & Hartman, 1976). Dealing with perfectionism among the gifted is often cited as one of the counselling needs of the gifted (Kerr, 1991; Silverman, 1993). Typically educators concerned with gifted children are concerned about two negative impacts of perfectionism: underachievement and emotional turmoil. In terms of underachievement, Whitmore (1980) reported that perfectionistic tendencies makes some gifted students vulnerable for underachievement because they do not submit work unless it is perfect. In terms of emotional stress, perfectionism is seen to cause feelings of worthlessness and depression when gifted individuals fail to live up to unrealistic expectations. DeLisle (1986, 1990) has provided anecdotal evidence that perfectionism places some gifted students at-risk for suicide.

Several things can be done to help individuals to effectively cope with perfectionism tendencies. First, individuals need to recognize that 80% of the reward structure comes from 20% of one's activities. This realization will help individuals concentrate on the few things that require extra effort. Second, individuals also need to develop the capacity for constructive failure by recognizing that present performance, even if imperfect, sets the tone for future improvement. Third, individuals need to develop self-concepts separate from their products. They need to understand that they have inherent dignity and self-worth which is unconditional. Fourth, they should recognize that the commitment to excellence is a lifelong struggle and they need to view present circumstances as a step toward the future. Fifth, individuals with perfectionistic tendencies need to set realistic goals. Finally, perfectionistic individuals need to find avocational interests and pursuits that can bring joy.

Sensitivity

There is consensus that gifted persons are characterized by heightened sensitivity. Parents, teachers as well as writers in the field of gifted education agree on this point. Sensitivity, as used in this context, is viewed as multi-faceted. It refers to both the cognitive as well as the affective domain (Mendaglio, 1995). In the cognitive area, sensitivity consists of perceptiveness. For example, gifted

children tune into the nuances of interpersonal communication. They can detect and respond to the subtleties of nonverbal cues such as eye contact or vocal qualities. All children engage in this perceptiveness especially when engaged in communication with significant adults, but the gifted child detects more of these cues than non-gifted. This heightened awareness of another person's verbal and nonverbal behaviour can lead to some interpersonal complications. One illustration of this is a situation where gifted children are asked to comply with a parent's or teacher's request. A gifted child may detect nonverbal signs of emotionality in the adult's nonverbal behaviour, such as changes in vocal qualities or facial expression. Rather than responding to the verbal part of the adult's communication, the child reacts to the emotional tone that he/she identifies in the adult. In some cases, the gifted child may take issue with the "how" of the request rather than the "what". It is not uncommon for such scenarios to result in the child's responding with: "you have no right to talk to me that way!" In addition to not complying to the request, a gifted child often comments on the manner in which the adult has communicated to the child. In other situations such perceptiveness leads to expressions of concern. For example, a child may ask a parent "What's wrong?" with appropriate vocal qualities when she/he notices nonverbal signs associated with negative emotions or stress.

In the affective domain, sensitivity consists of the child's experiencing of emotions in self and others. When parents and teachers refer to sensitivity in descriptions of gifted children, it is the affective domain to which they refer. In this sense, gifted children are usually easily moved emotionally. As with the cognitive aspects of sensitivity, the affective facet is also double edged. In the positive sense, a gifted child may be awestruck by daily experiences or appreciate aesthetic objects such as paintings. On the negative side, he/she may be easily offended or hurt by remarks of others. In some cases, the child may be so sensitive to criticism that we witness an overreaction to neutral statements made to them. For example, a parent makes a statement that she has noticed that the child has not done his/her homework. Parents are often suprised at the intensity of the child's emotional reaction to statements which contain no criticism or demands. Affective sensitivity also includes heightened awareness of the emotions in others. Some of these children are so adept at this that they actually experience the emotions of others. With this comes a concern for others. This empathic connection with others may extend well beyond a child's immediate family and environment. It can extend to feelings of concern, sadness, and frustration elicited by awareness of issues characterized by injustice around the globe.

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Fun in Sciencing

Micheline Rivard
Calgary Catholic Board of Education

The following activities are aimed at Science teachers who would like to enrich their Science classes and also have fun. These activities are for the junior high level but can easily be adapted at any level.

Activity #1

OBJECTIVE: to invent a dichotomous key to identify leaves.

This activity requires a fair amount of preparation from the teacher and 2 periods for the students. The students finish the work at home. It is an excellent activity to learn and practice a dichotomous key. It could be used at the elementary level with different objects:pens, pencils, scissors, paper ... instead of leaves with their scientific names.

Collect 11 different types of leaves from your neighborhood, one of each type per group of students. I put the leaves in an old phone book to dry them. Find the Latin name of each type of leaf using library books or phoning gardening centers.

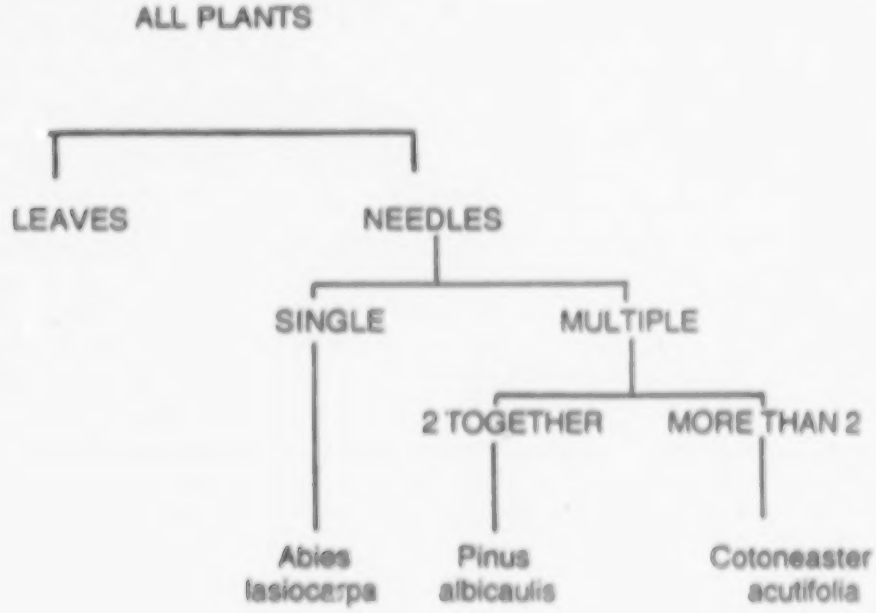
Ex.: lilac (common name) Syringa vulgaris
/ /
genus species

Also in books on plants, you will find the vocabulary you want your students to use for this activity (re: shapes of leaves, motif of the leaves' edges etc...). Give 11 different leaves to each group of (3) students. You can have more or less than 11 if you wish.

Students must first construct a diagram that will be used to identify the characteristics in the dichotomous key.

In a dichotomous key, the number of steps is equal to the number of organisms minus one.

11 leaves - 1 = 10 steps



After completing the rough copy of the diagram, students recopy it on a large construction paper gluing the leaves at the bottom (under their Latin names). Wide transparent tape works well.

Then, the students must produce the dichotomous key from the diagram. That's the easy part. They write this on a regular piece of paper.

DICHOTOMOUS KEY OF THE PLANTS

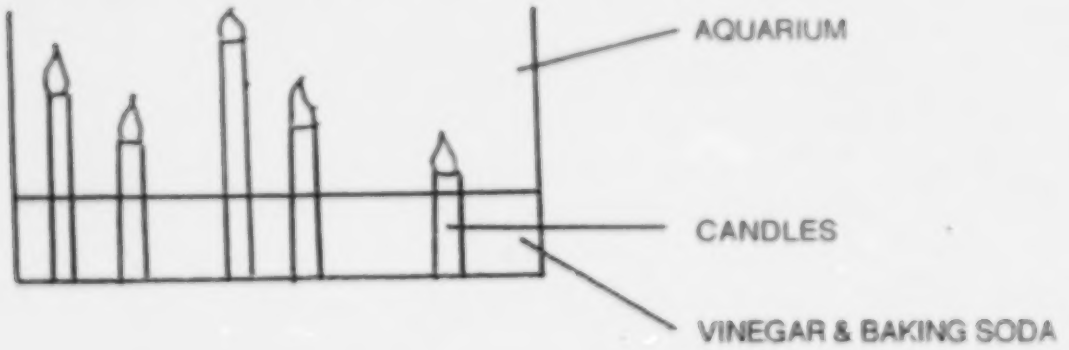
CHARACTERISTICS	IDENTIFICATION
1a) leaves	go to 4
b) needles	go to 2
2a) single	Abies lasiocarpa
b) multiple	go to 3
3a) 2 together	Pinus albicaulis
b) more than 2	Cotoneaster acutifolia
4a)	

10a)
b)

Students hand in one construction paper with diagram and the dichotomous key on a regular sheet of paper with all the names of the students in the group.

ACTIVITY #2

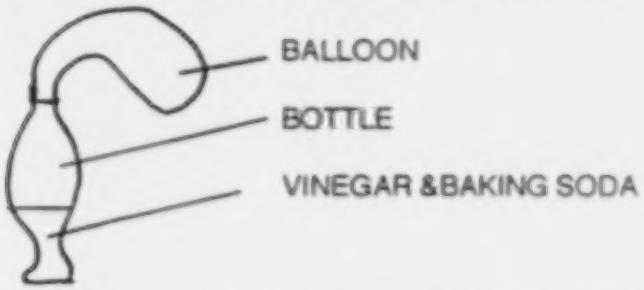
OBJECTIVE: to prove that carbon dioxide is a fire extinguisher.



The reaction of the vinegar and the baking soda produces CO_2. As the CO_2 rises, it extinguishes the candles one by one, the shortest to the tallest.

ACTIVITY #3

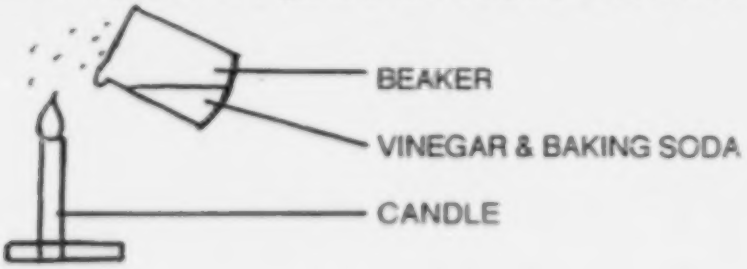
Objective: to prove that a gas (CO_2) is produced and that it can inflate a balloon.



As the CO_2 rises and fills the bottle, it inflates the balloon. Make sure you have inflated a new balloon a few times before attempting this experiment.

ACTIVITY #4

Objective: to prove that a gas is a fluid (and therefore can be poured like a liquid).



Pour the gas CO_2 over the flame; it will extinguish it. Make sure the liquid is not poured.

ACTIVITY#5

Objective: to prove that the gas oxygen is present.

Combustion, the action of burning is a chemical reaction where O_2 is one of the reactants and where heat is produced.

WEAR SAFETY GLASSES

1. Pour 15 to 20 mL of peroxide (H_2O_2) in a test tube.
2. Add about 1 teaspoon of manganese dioxide (MnO_2), a very dark powder.
3. The reaction of 1 and 2 produces a gas, oxygen.
4. Put a 100 mL graduated cylinder over the test tube while the reaction is happening to capture the gas.
5. While 4 is going on, light and put out a wood splinter. Make sure it remains red when you put it out.
6. Slide the (still red) splinter into the graduated cylinder (that now contains O_2).
7. The splinter will relight itself. Put it out again and slide it into the cylinder, it will re-light again.

THIS IS A VERY DRAMATIC EXPERIMENT.

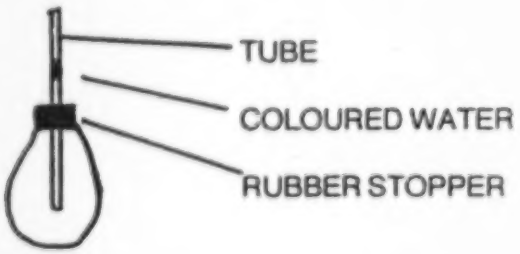
ACTIVITY #6

Objective: to prove that a gas expands when heated.

Similar to activity #3, use an empty glass bottle, put a balloon over it, heat up the bottle on a hot plate on low heat. As it heats up, the warm air will inflate the balloon.

or another version of it:

Put a rubber stopper in a bottle. Insert a glass tube or the empty transparent plastic tube of a pen into the stopper. Let a drop or two of coloured water slide into the tube.



Put your hands around the bottle. The air inside will warm up, expand and push through the tube. The colored water will shoot up.

ACTIVITY #7

Objective: to show density.

Pour some water in a beaker. Pour the same amount of alcohol (rubbing alcohol) in another beaker. Then drop one ice cube in each beaker. The ice cube will float in the first and sink in the second.

The density of alcohol is about 0.7 g / mL
ice cube 0.9 g / mL
water 1.0 g / mL

ACTIVITY #8

Objective: (for the teacher) To prepare assignments that will help students achieve.

Do you remember Bloom's taxonomy? When you plan an assignment, use as many as possible different levels of thinking. There are verbs that indicate each kind of thinking skill. For example: **knowledge** - define, fill in the blank, label... **comprehension** - explain, describe, put in order...

Prepare an assignment with one objective and try to cover this objective with the different levels of thinking. See following example:

Obj: To distinguish between HEAT AND TEMPERATURE (GR 9)

1. Draw 2 thermometers. On the first one, use the Celsius scale and the other the Kelvin scale. On the Celsius scale indicate these temperatures: -50°C, 0°C, 25°C, 37°C, 100°C. Indicate on the Kelvin thermometer their equivalent.

2. Compare the conductibility and the heating capacity of these 2 substances: aluminium and water. Explain the difference between these 2 words.

3. Energy can be reflected, absorbed or transmitted by a substance. Give an example of each and illustrate.

4. In an active solar system, we use water that runs in a building. What must we do if the temperatures go down below zero?

You Are What You Ask—The Power of Teaching Students' Questioning Skills for Enabling Thinking

Bernard Schwartz, University of Alberta
Garnet Millar, Alberta Education

A contemporary multifacted definition of the gifted and talented also recognizes students who are gifted and talented in the visual arts. The major purposes of a visual arts program for artistically gifted and talented students are to bring students together with high interests and abilities in art in ways that will broaden and deepen their knowledge about art, sharpen their art skills, and offer them learning opportunities rarely found in a regular classroom setting.

Gilbert Clark and Enid Zimmerman
Translations--From Theory into Practice
The National Art Education Association

"High school dropout rate of 30 percent." Canadian news media recently reported this nationally. The public was bewildered and dismayed; educators disillusioned and discouraged. Undeniably this is one of the most crucial issues facing education today.

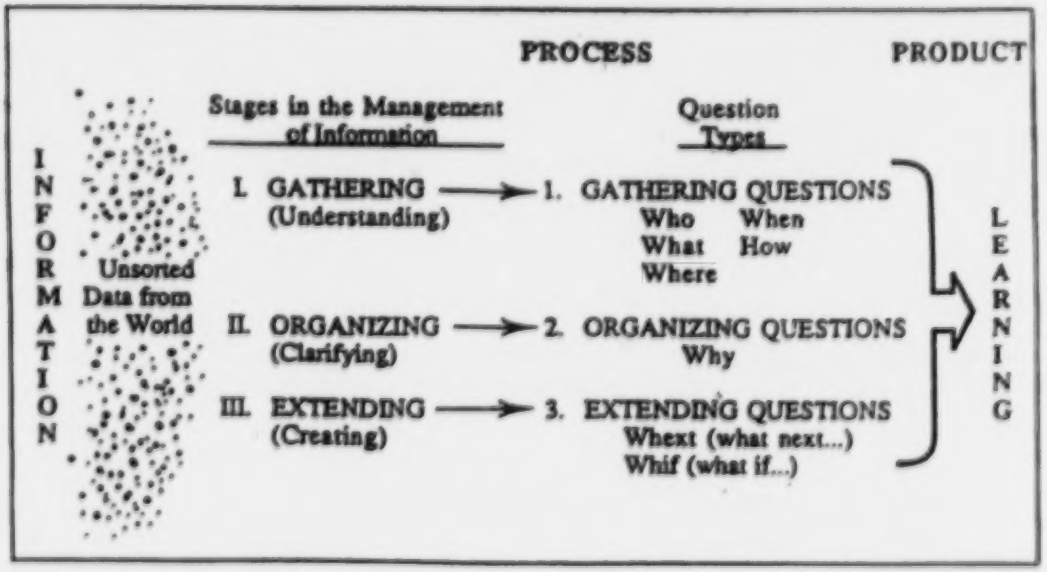
North American schools claim such worthy goals as educating students both now and for the changing, complex and unknown future. It is intended also that students become independent, self-directed and motivated inquirers who eventually will assume full responsibility for their own education. Yet students are deluged by great masses of information, often disjointed, unrelated and perhaps even irrelevant, and this characterizes much of public school education. This seems to be a contradiction of goals and means.

The writers believe that significant change will only result by reconceptualizing the whole teaching-learning process. In today's world educators need to teach higher order thinking skills to students to empower them to manage their own learning. Thinking --- both critical and creative --- should be at the heart of all our educational programs. And fundamental to thinking is the ability to ask questions --- good self-generated questions that both develop and reflect the inquisitive mind. Questioning and thinking are essential to problem-solving, abilities required for living in a dynamic world. In short, we need schools that put a high priority on educating competent thinkers.

Research of the writers and others (see references) supports our position *that students as learners need to be taught questioning skills and strategies in conscious and deliberate ways as fundamental to promoting thinking as a major goal of schools. Furthermore, greater attention should be given to teaching metacognition.* "Metacognition" concerns strategies students can use to reflect upon their own learning --- the "how," "when" and "what" of understanding, controlling and monitoring their own thinking and learning.

With this in mind the writers have devised the *Management of Information Model* of the three stages of conceptualizing the control of information including gathering information, organizing information, and extending information. Each stage is critical in understanding, clarifying and creating information. Certain types of questions can be used to manage information at each stage. The subject matter of art in schools has substantially broadened in recent years to include production along with history, criticism and aesthetics as interrelated components of a well-rounded art program. The six types of hierarchical questions asked by students in art classes based upon this model are included here to suggest the utility and application of this model.

Model of
Management of Information using Questions



This figure represents the model including corresponding categories of questions. This is meant to be used initially by teachers as a guide in teaching their students questioning. Its primary purpose, of course, is that students apply the model themselves to manage information which eventually results in effective thinking and learning.

Currently, the body of research and informed judgment seems to be in agreement with the following general characteristics relevant to artistic giftedness and talent: precocity, emergence through drawing, rapidity of development, extended concentration, self-directedness, possible inconsistency with creative behavior, and art as an escape. Furthermore, the particular characteristics of works and products of these students are demonstrated by: verisimilitude, visual fluency, complexity and elaboration, sensitivity to art media and random improvisation.

Our research to date has confirmed that most students, even in the early grades, have become masters at answering teacher questions. However, few students, even by late graduate school, have become more than novices at asking questions. The state of student questioning is remedial at best. A case for the deliberate teaching of questioning is presented here as an essential thinking skill in educating our students. The role of the teacher should be to nurture and teach the Socrates within their students. The writers have demonstrated how the categories of questioning skills can be implemented to increase both thinking and learning in contemporary art education programs at all levels, especially for those students who are identified as artistically gifted and talented.

ABOUT THE PRESENTERS

Dr. Bernard Schwartz is Professor of Art/Elementary Education, Faculty of Education, University of Alberta. In addition to authoring numerous publications and regular participation in educational conferences and seminars, he is the artist-teacher on ENCOUNTERS--the 10 part television series on art for elementary students, produced by the ACCESS NETWORK and Alberta Education. Dr. Schwartz has been a consultant to the National Gallery of Canada, Ottawa, contributor to the Junior Canadian Encyclopedia, advisory committee member of the Association for Supervision and Curriculum Development, Washington, D.C., and serves as publications review panel and consulting editor for several major art education journals. His chapter on assessment and reporting student learning in the visual arts appears in the 1996 Yearbook-Communicating Student Learning, of the Association for Supervision and Curriculum Development, one of the world's largest professional education leadership organizations.

Dr. Garnet Millar is Provincial Coordinator in Guidance and Counselling, Special Education Branch, Alberta Education. Dr. Millar is the author of several articles and books. Recently, he wrote an authorized biography of E. Paul Torrence "The Creativity Man" and the distinguished leader and scholar in the field of creativity research. As well, Dr. Millar has over 30 years experience as a teacher, counsellor, school psychologist, consultant, and assistant superintendent at the classroom, school jurisdiction, and provincial levels.

Intuition and Giftedness

Carolyn Yewchuk
University of Alberta

When Zerah Colburn was six years old, it was discovered that he knew the multiplication table perfectly and, in fact, could perform other incredible feats of mental calculation. Some examples from his autobiography (cited in Spitz, 1993) include correctly calculating the number of seconds in 2,000 years, the product of 12,225 and 1223, the square of 1,449, and the number of steps that must be taken (at 3 feet a step), to go 65 miles. Although many different people questioned him about the methods he employed, he was unable to explain how he did it. He calculated automatically.

Zerah became famous as a mathematical prodigy, and in the manner of other nineteenth century prodigies, exhibited his remarkable abilities throughout Europe and North America. In writing his memoirs as an adult he recalled how, between the ages of 8 and 11, he gradually developed a larger conceptual grasp of mathematics and a conscious awareness of his methods (cited in Spitz, 1993). He was then able to explain his procedures in detail.

There are many other instances of lightning calculators, some brilliant (Smith, 1983), some backward (Treffert, 1989). The latter group, often referred to as idiots savants, continue executing their amazing calculations without conscious awareness throughout their lives.

How can the automatic execution of such complex mathematical calculations be explained? What enables us to guess correctly without knowing how we arrive at the guesses? What mechanisms are at work when we perform intuitively, without prior conscious effort?

Definitions

The process of arriving at decisions or solving problems unconsciously is often referred to as intuition. Many psychologists have studied this phenomenon, and many definitions of intuition have been developed. A sampling of definitions formulated over a span of more than half a century follows:

- a method by which a subject becomes aware of an entity without such aid from the senses or from reason as would account for that awareness (Wild, 1938, p. 226)

- judgments which follow premises or steps of which the judge is unaware, and especially those he cannot put into words. The word has undesirable connotations, but there is no good substitute for it. The fact is evident that one frequently reaches a right conclusion without being able to state the

evidence which really determines it. An equally evident fact is that intuitive judgments are often wrong, and as long as they remain intuitive and unverbalized their flaws are not demonstrable. (Hebb, 1946, p. 89)

• knowledge based on experience and acquired through sensory contact with the subject without the "intuiter " being able to formulate to himself or others exactly how he came to his conclusions (Berne, 1949, p. 205)

• the intellectual technique of arriving at plausible but tentative formulations without going through the analytic steps by which such formulations would be found to be valid or invalid conclusions (Bruner, 1961, p. 13)

• the process of reaching a conclusion on the basis of little information which is normally reached on the basis of significantly more information (Westcott & Ranzoni, 1963, p. 595)

• in ordinary language the term refers to the person's feeling that a decision, judgment, or solution is correct, in the absence of supporting evidence (Bowers, 1994).

Functional Types

It can be seen from these definitions that there is no unanimity regarding the nature of intuition other than the apprehension of knowledge without conscious analysis. Goldberg (1989) has attempted to distinguish between different aspects of intuitive experience by describing six functional types: discovery, creativity, evaluation, operation, prediction and illumination. The first five types occur interactively in various combinations to comprise the range of ordinary intuitive experience. The sixth type pertains to what is commonly called mystical experience.

Discovery represents a "eureka" experience, spontaneous, unforeseen and sudden. The most famous example is Archimedes' discovery of the principle of water displacement in his bath. This type has a detective quality to it, since it can reveal verifiable facts, supply answers to a specific problem, or present a solution to a more general need. It comes after a dogged conscious and rational preparation phase, particularly in a specialized field.

Creativity is similar to discovery intuition in the nature of the experience itself, but instead of dealing with verifiable theory, facts or information, the creative function results in imaginative alternatives, options or possibilities in response to open-ended problems. The distinction is situation-dependent. Discovery intuition would apply when there is a single answer to a question, such as "What is the structure of the DNA Molecule?." Creative intuition would apply where there are a number of possible solutions, some better than others, as in all forms of artistic endeavor. With great art, however, the distinction between creativity and discovery intuition may be irrelevant if the artist is compelled to complete a product in only one particular way.

Evaluation refers to a binary kind of red light/green light function which directs choice or action. For example, a business manager may be faced with several alternatives, and decide on the better one according to "gut" feelings. The most famous instance of fortuitous evaluative intuition was the decision of Ray Kroc to purchase MacDonald's against the advice of his consultants and lawyers because in his "funny bone" it felt like a sure thing.

Operation serves to guide action, sometimes subtly, sometimes with irresistible force. It is similar to the evaluative function since there may be a yes/no quality to it, but in this case there are no alternatives to evaluate. Goldberg gives the example of Alexander Fleming, discoverer of penicillin, noticing that cultured bacteria had died on a plate contaminated by dust. Instead of just discarding the plate as a failed part of his experiment, he wondered why it had happened and began to search for an answer.

Prediction refers to foreknowledge or prophecy, and often accompanies evaluative or operative intuition, since decisions are made with the hope of achieving desirable results. Predictive intuition can involve negative (that plane is going to crash) or positive (that's the man I'm going to marry) feelings, with varying degrees of certainty.

Illumination transcends the other five functions. In fact it transcends all those things that we think of as experience, such as words, concepts, thoughts, and perceptions. There is no separation of knower and known; the subject/object duality of ordinary experience is dissolved. The subject (the experiencer) and the object (what is experienced) become one. In transcendence, the experiencer is conscious, but not conscious of anything; only awareness exists. There are degrees of transcendence, attainable in a developmental sequence through traditional Eastern study of yoga and other consciousness disciplines. Illumination can be considered the highest and most satisfying form of knowing because it establishes a genuine union between the self and the cosmos, a direct experience of God, nirvana, or a state of bliss. Once experienced, illumination upgrades all cognitive faculties and opens all other intuitive channels.

Levels of Intuitive Awareness

Vaughan (1989) distinguishes between different aspects of intuition not on the basis of function, but as levels of intuitive awareness. She identifies four levels: physical, emotional, mental, and spiritual. Two of these (mental and spiritual) bear strong resemblances to functions within Goldberg's (1989) typology.

• Physical - awareness of bodily sensations, e.g., physical tension, headaches or stomach aches in stressful situations. The cues of intuition on a physical level may not be perceived until they become painful.

• Emotional - awareness of feelings: sensitivity to other people's "vibes," instances of immediate liking or disliking with no apparent justification (e.g. love at first sight). What is commonly referred to as "woman's intuition" is intuition on the emotional level; women in our society are not taught to repress feelings as much as men and hence are more sensitive of their own feelings and that of others.

• Mental - awareness of images or "inner vision;" related to thinking, problem solving, mathematics and scientific inquiry. In western cultures this level of intuition is associated with the kind of discovery and invention involved in technological progress. Einstein, for example, reportedly played with mental images in developing his theory of relativity. The mental level is characterized by perception of patterns of order or change in intuitive flashes following the exhaustive use of logic and reason (the aha or eureka experience), and often occurs spontaneously during times of preoccupation with something else, for instance, during sleep or at rest. This level is similar to Goldberg's (1989) discovery function.

• Spiritual - associated with mystical experience; it is a form of "pure" intuition, independent from sensations, feelings and thoughts. There is direct knowledge of God and direct transpersonal experience of the underlying oneness of life (cf. Goldberg's illumination function). The practice of meditation prepares the mind for the experience of spiritual intuition by emptying it of the contents of consciousness.

Intuition and Gifted Students

Like the mental calculators and idiot savants, gifted students often report knowing some things automatically, without conscious processing. If pressed to explain how they arrived at the answer to a math problem, for example, they might reply, "It just popped into my head." It could be hypothesized that because of their high verbal, conceptual and abstract reasoning abilities, gifted students would exhibit the first five functional intuitive behaviors listed by Goldberg (1989). Research into the use of intuition by gifted students, however, is very sparse. Only one study appeared in an ERIC search of the literature. Hanson, Silver & Strong (1984) compared 176 elementary students attending a school for gifted children with 336 students attending the same grades in a regular school. They found that gifted students use a higher degree of intuition in their information processing and decision making than control students. Gifted students showed preferences for the following intuitive activities:

- generating possibilities beyond what is present, obvious or known
- generating ideas rather than putting them into action
- having their own way of doing things
- being patient with complicated details and working continuously if interested in the task
- working best in bursts of energy powered by enthusiasm

- being comfortable with open-ended tasks
- desiring to achieve important solutions to long-range and important social problems
- learning new skills even if not put to use.

Clark (1992) has suggested that intuition can be facilitated or discouraged by personal and social attitudes and the quality of the environment. Conditions that foster intuition include the following: a relaxed state, silence, focused attention, a receptive, nonjudgmental attitude, an ability to synthesize all brain functions, and novelty and variety in the environment. In contrast, the following conditions stifle intuition: focusing on mistakes instead of successes, avoiding change, seeking control and predictability, adhering rigidly to rules and set procedures, anticipating disasters instead of miracles, taking ourselves, our work, and our problems too seriously, and relying heavily on analytic procedures.

Teachers and parents who wish to foster intuition in their children/students can play an important role by:

- valuing and encouraging intuitive processes
- providing opportunities for educated guessing, hypothesis setting, probability testing
- being comfortable with mistakes, both the children's and personal
- emphasizing personal discovery over following rules and memorizing facts
- modelling intuitive behavior (Clark, 1992).

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